

***GEOICA SETULOSA* (PASSERINI) (HEMIPTERA: APHIDIDAE):  
NEW DISTRIBUTION RECORDS FOR NORTH AMERICA**

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*Abstract.*—We report the first eastern United States records of the fordine aphid *Geoica setulosa* (Passerini). Description and illustrations of the apterous viviparous female and a key to species of *Geoica* in the United States are provided.

*Key Words:* Aphidoidea, North America, key, turfgrass

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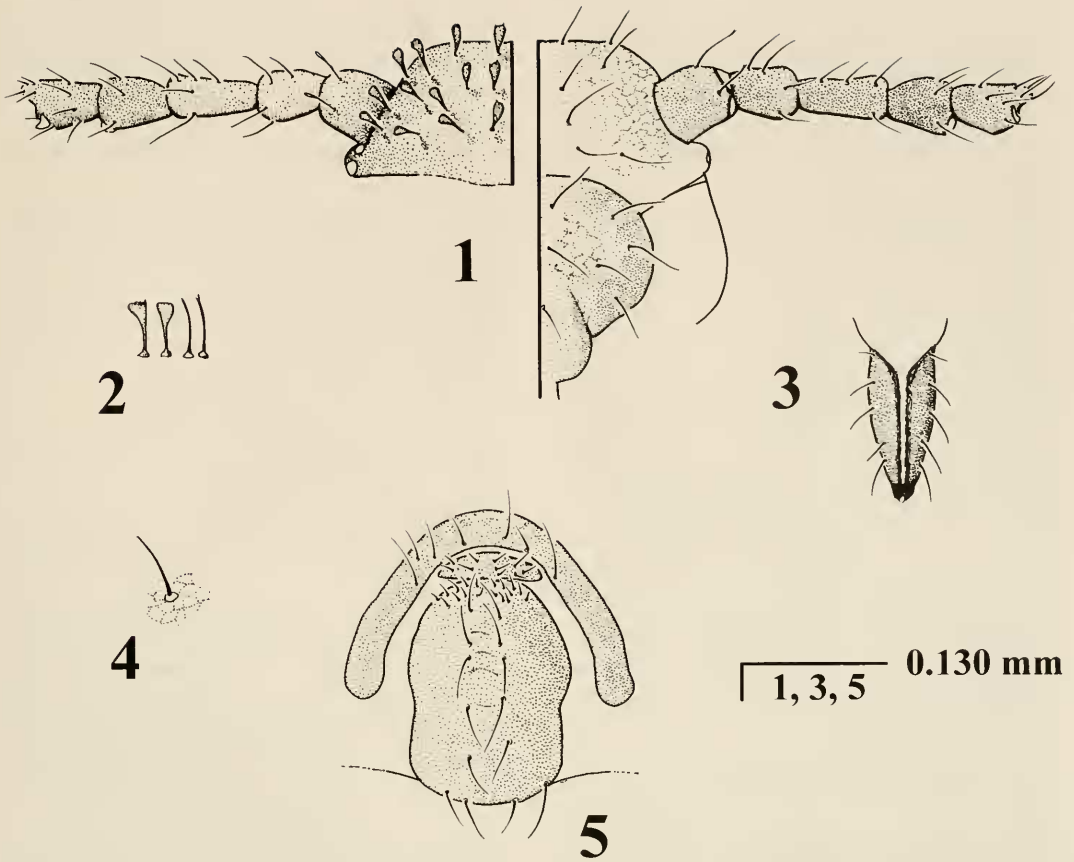
The genus *Geoica* (Hemiptera: Aphididae) is comprised of at least 14 species worldwide with the possibility of *Geoica utricularia* (Passerini) representing a complex of species (Eastop and Hille Ris Lambers 1976, Remaudière and Remaudière 1997). *Geoica* is considered an Old World genus (Blackman and Eastop 2000) and, until recently, four species of *Geoica* were recognized from North America: *Geoica lucifuga* (Zehntner), *Geoica pellucida* (Buckton), *Geoica squamosa* Hart, and *Geoica utricularia* (Passerini) (Smith and Parron 1978). However, *Geoica pellucida* (Buckton) and *Geoica squamosa* Hart are now both considered synonyms of *Geoica utricularia* (Passerini) (Remaudière and Remaudière 1997). Certain members of this genus exhibit a complex, 2-year life cycle with alternation between galls on *Pistacia*, pistachio (Anacardiaceae), and migration to and from their secondary host where populations feed on the roots of Gramineae and occasionally Cyperaceae (Brown and Blackman 1994, Blackman and Eastop 2000).

*Geoica setulosa* (Passerini) has been re-

corded from northwestern and central Europe, Italy, Iran, Turkey, and has recently been reported as occurring in the United States from Idaho (Blackman and Eastop 2000). Recent collections of *G. setulosa* from Kentucky indicate that it has a much greater distribution than its first collection from Idaho would indicate. In Iran, *G. setulosa* is holocyclic with its primary host, *Pistacia khinjuk* Stocks. In Europe, it is exclusively anholocyclic on grass roots (Blackman and Eastop 2000). Collections of *G. setulosa* in the United States have been made from roots of grasses and English plantain.

#### MATERIALS AND METHODS

Synoptic descriptions are based on published descriptions as well as material from the Aphididae portion of the National Collection of Insects (USNM), Beltsville, Maryland. In Specimens Examined, apterous adults are abbreviated as “ap. ad.” For specimens collected at the same locality, on the same date, and from the same host plant as previously listed, the duplicate information is not repeated. Unless otherwise not-



Figs. 1–5. *Geoica setulosa*. 1, Dorsal (left) and ventral (right) aspects apterous adult female head and antennae. 2, Variations of body setae. 3, Ultimate rostral segment. 4, Acuminate ventral abdominal seta with polygonal reticulate pattern. 5, Anal plate region.

ed, voucher material consists of a single slide (sl.). Specimens were measured using a Nikon Eclipse E600<sup>TM</sup> compound microscope. Measurements are presented in millimeters (mm) as minimum and maximum ranges of representative specimens.

*Geoica setulosa* (Passerini)  
(Figs. 1–5)

- Tychea setulosa* Passerini 1860: 40.
- Tycheoides setulosa*: Theobald 1916: 52.
- Geoica setulosa*: Theobald 1929: 197.
- Geoica herculana* Mordvilko 1935: 215.
- Geoica setulosa*: Eastop and Hille Ris Lambers 1976: 204.
- Geoica setulosa*: Heie 1980: 198.
- Geoica setulosa*: Remaudière and Remaudière 1997: 240.

Field characters.—Coloration of apterous viviparous females range from "... dirty whitish or greenish grey ..." (Heie 1980) to "... yellowish-white to greyish-white, some creamy ..." (Theobald 1929); "... antennae dusky, apices darkened; legs brown; rostrum dark at apex ..." (Theobald 1929). In specimens preserved in EtOH the head, prothorax, legs, antennae, and rostrum are crineous, the last segment of the rostrum is fuscous, and the base of most body setae is delineated by slight amber markings. Body form is globose.

Recognition characters from slide-mounted specimens.—Apterous viviparous female (Figs. 1–5): Body ovoid without wax gland plates, length 1.500–2.136 mm; width through eyes, 0.279–0.409 mm. Eye

with three ommatidia. Antenna 5-segmented (Fig. 1), shorter than body, slightly darker than rest of body, without secondary sensoria, primary sensoria elongate and everted; length of segment: I, 0.062–0.086 mm; II, 0.062–0.081 mm; III, 0.093–0.123 mm; IV, 0.062–0.068 mm; base of V, 0.056–0.074 mm; terminal process of V, 0.019–0.031 mm. Setae on body and appendages variable, ranging from acuminate, multifid, capitate, to flabellate (Fig. 2), with dense random placement on dorsum. Rostrum extending to metacoxae; length of ultimate segment (Fig. 3), 0.136–0.167 mm, with 8–10 accessory setae, shorter than hind tarsal segment II. Length of metafemur, 0.223–0.279 mm; metatibia, 0.217–0.310 mm; metatarsus II, 0.087–0.093 mm. Abdominal venter with polygonal reticulate pattern (Fig. 4). Cornicles absent. Anus positioned dorsally, anal plate rectangular with numerous small setae dorsally and a median row of paired setae (Fig. 5).

Biology.—*Geoica setulosa* is anholocyclic in Northern and Central Europe with alatae being extremely rare or absent (Heie 1980). It feeds on the roots of grass species such as *Agrostis*, *Alopecurus*, *Corynephorus*, *Festuca*, and *Holcus* (Heie 1980) and has also been recorded from *Setaria* sp., *Oryza sativa* L., and *Triticum vulgare* Vill. [= *Triticum aestivum* L.] (Theobald 1929). It was reported in Idaho (Blackman and Eastop 2000) where it was collected on *Panicum capillare* L., *Poa pratensis* L., *Hordeum jubatum* L., *Echinochloa crus-galli* (L.) Beauvois, *Phalaris arundinacea* L., *Avena fatua* L., *Setaria lutescens* (Weigel) F. T. Hubbard [= *Pennisetum glaucum* (L.) R.Br.], and “?crabgrass” (Halbert, personal communication). *Geoica setulosa* has also been associated with ants including *Lasius niger* (L.) (Theobald 1929) and *Lasius flavus* (F.) (Heie 1980, Blackman and Eastop 2000). *Geoica setulosa* collected in Kentucky always were found associated with the ant *Lasius neoniger* Emery on the roots of grass. Alatoid nymphs were collected in the population of *G. setulosa* and,

while they could not be identified with certainty to species, we can assume that winged adults of *G. setulosa* may occur in Kentucky. *Geoica setulosa* is probably also anholocyclic in the United States.

Specimens examined.—U.S.A.: Kentucky, Lexington, University of Kentucky lawn #1, on Kentucky bluegrass [*Poa pratensis*], R. López collector, USNM: V-4-1999 (20 ap. ad. ♀ on 6 sl.); Spindletop Research Farm, on Kentucky bluegrass [*Poa pratensis*], R. López collector, USNM: V-24-1999 (1 ap. ad. ♀); Spindletop Research Farm, on Falcon II tall fescue [*Festuca arundinacea* Schreber], R. López collector, USNM: VI-19-1999 (16 ap. ad. ♀ on 6 sl.); on Aurora hard fescue [*Festuca longifolia* Thuill], R. López collector, USNM: VI-19-1999 (14 ap. ad. ♀ on 5 sl.); on Adelphi Kentucky bluegrass [*Poa pratensis* L. *adelphi*], R. López collector, USNM: VI-19-1999 (1 ap. ad. ♀); on Palmer II perennial ryegrass [*Lolium perenne* L.], R. López collector, USNM: VI-19-1999 (4 ap. ad. ♀ on 3 sl.); on Kentucky bluegrass [*Poa pratensis*], L., R. López collector, USNM: VI-25-1999 (1 ap. ad. ♀); on KY 31 tall fescue w/endophyte, R. López collector, USNM: VII-02-1999 (2 ap. ad. ♀).

KEY TO APTERAEE OF NORTH AMERICAN  
*GEOICA*  
(Modified from  
Blackman and Eastop 2000)

1. Anal plate with numerous subequal setae randomly dispersed . . . . . *Geoica utricularia* group
- Anal plate with median row of paired, long setae in addition to shorter dorsal setae (Fig. 5) . . . . . 2
2. Dorsal body setae randomly placed; primary sensorium elongate; last rostral segment 0.136–0.167 mm long . . . . . *Geoica setulosa* (Passerini)
- Dorsal body setae forming transverse rows; primary sensorium subcircular; last rostral segment 0.170–0.240 mm long . . . . . *Geoica lucifuga* (Zehntner)

DISCUSSION

Although members of *Geoica* are not considered economically important (Footitt and Richards 1993), their association with

grass and aphid-tending ants can be problematic. This is especially true where closely-mowed turfgrass is managed on golf courses. Associated ants, e.g., *L. neoniger*, tend to build mounds around the plants that serve as hosts for *Geoica*. These ant mounds are not only unsightly but they smother the grass, dull mower blades, and disrupt the smoothness and uniformity of playing surfaces, including tees, fairways, and putting greens (López and Potter 2000).

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